

Appl. No. : 10/025,310 Patent Documents cited
Amdt. dated Jan 7, 2005
Reply to the Office Action of Jun 15, 2004

U.S. PATENT DOCUMENTS CITED in the SPECIFICATION:

U.S. Patent No. 3,629,600: EMERGENCY TRAFFIC LIGHT CONTROLLER

U.S. Patent No. 3,933,354: REFLEX TESTING AMUSEMENT DEVICE

U.S. Patent No. 4,702,475: SPORTS TECHNIQUE AND REACTION TRAINING
SYSTEM

U.S. Patent No. 5,325,340: PACING DEVICE

U.S. Patent No. 5,812,239: METHOD AND ARRANGEMENT FOR THE
ENHANCEMENT OF VISION AND/OR HAND-EYE COORDINATION

U.S. Patent No. 5,897,457: ATHLETIC PERFORMANCE MONITORING SYSTEM.

U.S. Patent No. 6,066,105: REFLEX TESTER AND METHOD FOR MEASUREMENT

U.S. Patent No. 6,278,378 B1: PERFORMANCE AND ENTERTAINMENT DEVICE
AND METHOD OF USING THE SAME

U.S. PATENT DOCUMENTS CITED in the REMARKS:

U.S. Patent No. 3,789,402: ELECTRONIC SIGNAL DEVICE AND METHOD

U.S. Patent No. 4,502,489: APPARATUS FOR MEASURING AUDITORY
REACTION TIME.

U.S. Patent No. 4,949,320: ACOUSTIC SIGNAL APPARATUS.

U.S. Patent No. 5,921,890: PROGRAMMABLE AUDIBLE PACING DEVICE.

U.S. Patent No. 2001/0002928 A1: WIRELESS ATHLETIC TRAINING
COMMUNICATOR.

U.S. Patent No. 2001/0032278 A1: REMOTE GENERATION AND DISTRIBUTION
OF COMMAND PROGRAMS FOR PROGRAMMABLE DEVICES.

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1. The response to the Office Action of Jun 15, 2004 which was previously submitted and dated Aug 28, 2004, but which was not accompanied by an RCE transmittal, should not be entered into the record. This is also indicated in section 1.a.ii of the attached RCE. The present reply contains the same information but has been reformatted as suggested by Examiner O'Neill during the telephone conversation of Jan 4, 2005. The present reply is accompanied by a signed RCE and fee payment.
2. **Claims 3, 4, 22, 23, 26, 27** were not changed from the previous amendment. **Claims 2, 11, 24, 25, 28-36** have been further modified from the previous amendment.
3. The examiner objected under 35 USC 112 that **Claims 24-25, 30-36** were indefinite due to insufficient antecedent. Previously the claims attempted to indicate "set of allowed device state values" by using the plural "device states", and the "current device state" by using the singular "device state". Unfortunately the term "device state" then became ambiguous between "the current device state" and "one of the allowed device states". Accordingly, **Claim 2** has been modified as shown in **page 5, lines 3-17**. Now "current device state" refers to the state currently occupied by the device, "device states" to the full set of allowed states or a subset thereof, and "device state" to one of the allowed device states.
4. The examiner objected under 35 USC 112 that **Claim 25** had insufficient antecedent basis for the term "the occupancy values". Accordingly, that claim has been amended

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to define “occupancy values” within the claim itself. The marked up version is found on **page 7, lines 1-3.**

5. The examiner objected under 35 USC 112 that **Claim 24** had insufficient antecedent basis for the term “the device state order”, which referred to the clause “said means determining the timing and order in which the device transitions between device states” in **Claim 2, page 5 lines 10-11.** Accordingly, **Claim 24** has been amended to use instead the term “the order of transitions between device states”, which is fully supported by the text in **Claim 2.** The marked up version is found on **page 6, lines 18-20.**
6. The examiner objected under 35 USC 112 that **Claims 30-33** had the same antecedent problem as did **Claim 24.** Accordingly all of these claims have been reworded in the same manner as for **Claim 24.** The marked up versions are found on **page 7, lines 13 through page 8, line 3.**
7. The examiner objected under 35 USC 112 that **Claims 34-36, on page 8 lines 4-17,** had insufficient antecedent basis for the term “the four states of the device”.
Accordingly, these dependent claims have been amended via the addition of a clause that states explicitly “the device utilizes four device states”. The parent **Claim 11** now implicitly defines the number of device states as two or more via “device states” **page 6, line 4** and “the average time spent in each device state” **page 6 line 5.** **Claim 11** therefore offers sufficient antecedent basis for the definition of a device with four states as used in modified **Claims 34-36.**

8. The Examiner objected with respect to **Claims 34-36**, on **page 8 lines 4-17**, "...one of ordinary skill would not be able to ascertain how the device can be required to set specific commands to each state as this is not defined nor limited by the parent." The function of the device is to present device states with a useful order and timing. The parent method in **Claim 11c page 6, lines 8-10** says, with respect to the athletes using the device, "the device displaying said current device state to the athletes in a form *interpretable by them* as a change of the environmental state within the context of the current athletic activity". **Claims 34-36** provide specific examples of such interpretations within particular athletic environments and each is supported by the specification, for instance in the **Summary of the Invention** section and **Table 1**. An analogy may be helpful. A coin presents only two "device states" (heads or tails) but it is still commonly used for many different tasks: determining which team bats first, deciding who chooses the movie, and so forth. What the flip means is entirely a function of the environment in which it is interpreted. Similarly, the present device does not explicitly map commands to the device states, the athletes do so by agreeing among themselves which device state corresponds to which environmental state. In other words, by setting the rules of the activity to include how the signals presented by the device will be interpreted. **Table 1**, the basis for **Claim 34**, provides one example of such an interpretation. This particular set of rules for the activity was chosen partially for its simplicity and partially for its mnemonic value (Red for Right and bLue for Left). Other mappings are possible and the athletes are free to use them.

9. The examiner objected under 35 USC 101 that independent **Claim 11** and its dependent **Claims 30-36** included nonstatutory matter, in **Claim 11d**. This part of **Claim 11** has been removed **page 6, lines 11,12**.
10. The examiner objected under 35 USC 103 that the claims for the present device are unpatentable over Karrenberg. An overview of the Karrenberg device compared to the present device is presented here, with further discussion with respect to the particular claims presented in the remarks below. Karrenberg U.S. Pat. No. 4,949,320 discloses an athletic interval training device. This device indicates to the athlete a period for each of several athletic activities, typically a repeating run/walk/rest cycle. Interval training devices are essentially modified clocks, they provide the athlete with a fixed and utterly predictable series of changes in the athletic environment. The present device produces an uncertainty – the athlete cannot predict, except statistically, what the environmental state signaled by the device will be at some future time. Both Karrenberg's device and the present device allow the athlete to set the mean time in each state. However, the present device will only asymptotically approach that mean time over a long period and will have a large variance in the duration of each state. Conversely, Karrenberg's device will have no variance (within the accuracy of the implementation) in the duration of each state. This is consistent with the intended uses. Karrenberg's device is a long term pacing device, indicating to the athlete a particular exertion level to maintain for several minutes. The present

device instead attempts to mimic the unpredictable and often rapid changes that occur in athletic events.

11. The examiner rejected **Claim 2** under 35 USC 103 as being unpatentable over

Karrenberg. However, the applicant respectfully argues against the rejection of **Claim 2** because, while both are timing devices, they are not the same kind of timing device. One skilled in the arts would recognize that the principle of operation of Karrenberg's device and the present device are radically different. Karrenberg's device is a ring of timers (most clearly described in **column 2 lines 42-48**) in which the period of the oscillation is determined by the period of a small number of timers, each of which triggers the next timer. Once the period of each timer in the Karrenberg device has been set the device's behavior is fully specified and predictable. One skilled in the arts would recognize that the present device uses a table driven algorithm for emitting a series of states in random order with predefined statistical properties (for instance, state 1 occurs twice as often as state 2). To configure the present device, one must specify: the minimum hold time for a device state, the mean transition frequency, whether transitions are periodic or random, the transition order (random or sequential), and the average time spent in each device state (via the occupancy values). Once set, the state of the present device at a given time generally cannot be predicted accurately.

12. A further argument against the rejection of **Claim 2** is that the Karrenberg device, being a pacer, would be ill suited for the purposes the present device is intended to

fulfil. Consider a baseball pitching drill where the training device indicates which of three pitches to throw, or to throw to first base (as previously described in the specification in the last paragraph of **Summary of the Invention**). After a few cycles the players would be able to predict when Karrenberg's device would present a particular state and they would be able to prepare for that state before the display indicated it. Conversely, the present device would generally be configured so that the next state could not be predicted (except statistically, like the weather).

13. Another argument against the rejection of **Claim 2** is that Karrenberg does not suggest introducing random fluctuations in the timing of his device. Karrenberg did not suggest this modification because his pacing device was intended for use in interval training where the goal is to train hard, medium, and rest, each for specified periods of time. The duration of these intervals is typically set to achieve a particular performance goal or metabolic rate target. In neither case would random variations from the specified time intervals be consistent with the desired training objective.

14. Another argument against the rejection of **Claim 2** concerns the examiner's contention that for the Karrenberg device: "The device further axiomatically includes a controller that can read the device setting to maintain the state in accordance with those setting (sic) and communicate to the display of the state (Column 2) as the device is programmed and the functionality would require such a device to maintain operability." However, the device described by Karrenberg is a ring oscillator and it is "programmed" only to the extent that the duration of each stage must be set. This

process is akin to adjusting the variable resistors on a circuit board, the settings are not “read” per se, but are used directly by attached circuitry. Karrenberg’s description seems to have suffered somewhat in the translation but his description of **Figure 2** from **Column 4 line 66** through **Column 5 line 24** indicates two oscillators (**1a, 2a**), which he refers to as “tappers”, which are followed by counters (**1b, 2b**). He states in **Column 2 line 52** that the device can be set in intervals of 1-999 seconds, and **13** in **Figure 1** is a 3 decade numerical switch. Consequently, one skilled in the arts would assume that the tappers **1a, 2a** have a frequency of 1 Hz and the counters **1b, 2b** count up (or down) from the value set by the 3 decade switches **13, 14**, these values being read directly by the counter circuits. Conversely, in the present device the switches are indeed read by a controller, and those values which are read are used within a program executed by that controller. In summary, Karrenberg’s device does not contain a programmable controller equivalent to that of the present device.

15. Another argument against the rejection of **Claim 2** is that Karrenberg did not actually suggest the concept of “environmental states” and the interpretation of his device in these terms can only be made retrospectively with respect to the present application. Even retrospectively the “environmental states” described in Karrenberg consist solely of levels of exertion: hard (running), medium (walking), none (resting). The environmental states explicitly described in the present application are more varied, change more quickly, and typically refer to changes in direction or a choice of different actions. Moreover, the different states described for the present device

typically do not differ significantly in the level of exertion. That is, going right or left around a soccer cone requires about the same effort.

16. The examiner rejected **Claim 3** under 35 USC 103 because Karrenberg's device (might be redesigned so that it) also contains a microprocessor. One skilled in the arts understands that countless devices including Karrenberg's and that of the present application may utilize microprocessors. However, the applicant respectfully submits that **Claim 3** (as currently amended) is valid because it modifies the amended **Claim 2** which, as is argued above, describes a device which is neither Karrenberg's device nor an obvious extension of it.

17. The examiner rejected **Claim 4** under 35 USC 103 because Karrenberg's device also utilizes LEDs and discloses that said LEDs may be of different colors. However, the applicant respectfully submits that **Claim 4** is valid because it modifies the amended **Claim 2** which, as is argued above, describes a device which is neither Karrenberg's device nor an obvious extension of it.

18. The examiner rejected **Claim 11** under 35 USC 103 with the statement "the device is set in the manner it is to be varied". However, the applicant respectfully submits that the manner in which Karrenberg's device varies and the manner in which the present device varies are quite different, consequently, they are not set the same way. For instance, Karrenberg's device sets a single duration for each timer. **Claim 11a page 6 lines 4-6** says, "setting the mean frequency of transitions between device states, the minimum hold time and the average time spent in each device state, and the order of

the device state transitions”. These quantities must all be set, and specified as a minimum or an average, because the present device varies device states in time with nonzero variance. Karrenberg’s device provides no such variance, consequently the minimum hold time, the frequency of transitions, and the average time spent in each device state are not independent values, resulting in a requirement for setting only a single duration value for each timer.

19. The examiner rejected **Claims 22-25** under 35 USC 103 citing that both Karrenberg’s and the present device set various timing parameters. However, the applicant respectfully submits that, as noted in the preceding paragraphs, those parameters set for the present device are not those set for Karrenberg’s device. In Karrenberg’s device a state has the same length in each cycle. In most modes of operation of the present device there is intentionally considerable variance in the timing and order of the device states. The mean frequency of **Claim 22** is qualified that way because the variance of the device in most operating modes precludes specifying a single transition frequency. Similarly, the minimum hold time of **Claim 23** is qualified that way to (partially) define the variance (which increases as the difference between the inverse of the mean frequency and the minimum hold time). **Claim 24** specifies random or sequential transitions between device states. Karrenberg’s device provides only for sequential device state transitions. Doing otherwise would be contrary to the purpose of his device since it would randomly produce state sequences like “rest rest rest” and “run run run” which make little sense in the intended context

of interval training. The occupancies set in **Claim 25** define the average time spent in each device state, once again, this is required due to the variance of the present device.

20. The examiner rejected **Claim 26** under 35 USC 103 because Karrenberg's device also may use a battery. However, the applicant respectfully submits that **Claim 26** is valid because it modifies the amended **Claim 2**, which as is argued above, describes a device which is neither Karrenberg's device nor an obvious extension of it.
21. The examiner rejected **Claim 27** under 35 USC 103 because Karrenberg's device also may use a power switch. However, the applicant respectfully submits that **Claim 27** is valid because it modifies the amended **Claim 2**, which as is argued above, describes a device which is neither Karrenberg's device nor an obvious extension of it.
22. The examiner rejected **Claim 28** under 35 USC 103 because Karrenberg's device could be built using a conical case and rings of LEDs instead of single lights. However, the applicant respectfully submits that **Claim 28** is valid because it modifies the amended **Claim 2**, which as is argued above, describes a device which is neither Karrenberg's device nor an obvious extension of it.
23. The examiner rejected **Claim 29** under 35 USC 103 because Karrenberg's device uses differently colored lights. However, the applicant respectfully submits that **Claim 29** is valid because it modifies the amended **Claim 2**, which as is argued above, describes a device which is neither Karrenberg's device nor an obvious extension of it.

24. The examiner rejected **Claims 30-33** under 35 USC 103 stating that “Karrenberg discloses that the device can have its transition programmed, thus the usage of random, periodic, or sequential order and timing would be obvious to a skilled artisan as it merely represents the usage of the device and would not require a different structure. However, the applicant respectfully submits that **Claims 30-33** are valid for the same reasons described with respect to **Claim 2** above. In brief, those reasons are: the device mechanisms are very different (**remark 11**), Karrenberg’s device is a pacer and so not suitable for the tasks targeted by the current device (**remark 12**), and the proposed addition of randomness would have rendered Karrenberg’s device unsuitable for its original intended purpose (**remarks 13 and 19**).

25. Another argument against the rejection of **Claims 30-33** concerns the examiner’s contention that Karrenberg’s device “can have its transition programmed.” Karrenberg describes a device comprised of a ring of timers, each of which may be set to fire after a specific time and which fire in an invariant circular order. The device as described by Karrenberg provides no mechanism to reconfigure it from a sequential order of firing to a random order of firing. Neither does it provide for varying the duration of each state randomly. Such a usage therefore requires a different structure, in fact, one similar to that of the present device.

26. Another argument against the rejection of **Claim 33** must be considered separately. One skilled in the arts would understand that when the order of the device state transitions is set to sequential, and the timing of the device state transitions is set to

periodic, then all variance has been removed from the present device and it is reduced to a timed signal flasher which appears externally to behave in a manner similar to Karrenberg's. However, the manner in which the present device is set while in this mode still differs from the way Karrenberg's device is set, because the same controls for setting transition frequency, occupancy, and hold times must be used as for the other modes.

27. A further separate argument against the rejection of **Claim 33** may be made in terms of the utility of the present device. Players tend to bunch up in the typical soccer dribbling drill course using a line of cones. On many practice fields coaches may be seen trying to relieve this traffic congestion by setting up two cone lines and starting pairs of players with a verbal "go" command. One skilled in the arts would recognize that **Claim 33** allows a further modification of this soccer drill that frees the coach from the task of acting as a gate. Arrange the two cone lines in a V with the present device placed at the tip of the V and set to cycle between "left" and "right" (but not "left or right" or "wait") at a fixed interval long enough to space out the players on each path. One player per transition is directed onto the indicated path. This application of **Claim 33** is consistent with other uses of the device (directing players right or left), and is in no way indicated by Karrenberg, who speaks only in terms of interval training. Moreover, the method of **Claim 33** is required here because this gate function can only be poorly implemented with the present device when using the methods described in **Claims 30-32**. The variance induced by these other methods is

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counterproductive in this instance, resulting in situations where too few or too many players are loaded onto each path.

28. The examiner rejected **Claims 34-36** under 35 USC 103 stating that “Karrenberg discloses the device can be used in a number of sports where transitions are required. A skilled artisan understands soccer, basketball, and baseball all require such transitions.” However, the applicant respectfully submits that **Claims 34-36** are valid. Karrenberg discloses an interval training device. He states repeatedly that this is its purpose and provides no indications that he envisions any other use for it. His device provides no mechanism to introduce variance in its cycle (the duration of any given state will be the same in every cycle, as will be the order in which the states are presented.) Accordingly Karrenberg’s device, offering no variance in timing, is utterly predictable and so completely unsuitable for the methods described in **Claims 34-36**. This is not to say that Karrenberg’s device could not be used in these sports, only that it would be used as he described it, for interval training, which is not the use described for the present device.

29. Another argument against the rejection of **Claims 34-36** is that they modify **Claim 11**, which as described above, describes a device that is not Karrenberg’s device.

30. The examiner considered U.S. Pat. No. 3,789,402 pertinent to the applicant’s disclosure. Heywood et al. U.S. Pat No. 3,789,402 discloses a device that may be used either in interval training (like Karrenberg’s) or in pacing applications (like Ramsey U.S. Pat No. 5,325,340, discussed in the specification). These two classes of

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device have already been described extensively in the specification and above so the applicant believes it sufficient to note that the arguments differentiating those classes of device from the present device apply equally to Heywood's device.

31. The examiner considered U.S. Pat. No. 5,921,890 pertinent to the applicant's disclosure. Miley U.S. Pat. No. 5,921,890 discloses yet another athletic pacing device, this one being optimized for use in swimming. As is true for the pacing devices disclosed above, it is designed to produce a certainty, in this case it emits a periodic signal to which the athlete attempts to synchronize swimming strokes. The utility of the present device is quite different, it is intended to signal unpredictable changes in the athletic environment. The sorts of unpredictable state changes provided by the present device are not appropriate for this type of pacing training. The present device would be better employed aquatically in the training of water polo players, who could be signaled to swim in various directions, for various periods of time, in an unpredictable manner.

32. The examiner considered U.S. Pat. No. 4,502,489 pertinent to the applicant's disclosure. Alston et al. U.S. Pat. No. 4,502,489 disclose yet another member of the athletic measurement devices typified by Elstein et al. U.S. Pat. No 4,702,475 which is discussed in the specification. The arguments of the replacement paragraph on page 3 apply equally to Alston.

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33. The examiner considered U.S. Pat. No. 6,278,378 B1 pertinent to the applicant's disclosure. Discussion of this patent was already present in the specification, albeit minus the "B1", which is corrected in the replacement paragraph on **page 3**.
34. The examiner considered U.S. Pat. No. 2001/0002928 A1 pertinent to the applicant's disclosure. Cummins, U.S. Pat. No. 2001/0002928 A1, describes a "wireless athletic training communicator". The applicant respectfully submits that the Cummins device is of minimal relevance to the present patent in its current form, as no claim is made for distributing device states remotely, although alternative embodiments are mentioned that could utilize a similar technology **page 4 lines 11-17**. Moreover, Cummins does not indicate that the content of the communication to the athlete involves indicating athletic environmental states.
35. The examiner considered U.S. Pat. No. 2001/0032278 A1 pertinent to the applicant's disclosure. Brown et. al, U.S. Pat. No. 2001/0032278 A1 describe "remote generation and distribution of command programs for programmable devices". The applicant respectfully submits that Brown's device is of minimal relevance to the present patent in its current form, as no claim is made for remote programming, although that is mentioned as a possible alternate embodiment in the replacement paragraph on **page 4 line 12**.
36. If after reviewing the amended application and these remarks the examiner finds that the application contains patentable material but the claims are still not technically

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adequate the applicant respectfully requests that the examiner write acceptable claims pursuant to MPEP 707.07(j).

37. The applicant respectfully submits that no new matter has been added to the specification in this amendment.

38. The applicant submits that the issues noted by the examiner in the second Office Action have been resolved. The amended **Claims 2, 24, 25, and 30-36** have been demonstrated to satisfy the conditions of section 112; the amended **Claims 11, and 30-36** have been demonstrated to satisfy the conditions of section 101; and all claims in the present application have been shown not to be encompassed by Karrenberg and so satisfy the conditions of section 103; There are major differences between Karrenberg's device and methods and those of the present application; One skilled in the arts would not obviously extend the teaching of Karrenberg to encompass the present application as doing so would either introduce elements contrary to the teaching of Karrenberg or would introduce concepts outside of the scope of his invention. Accordingly, the applicant submits this amended application in the belief that it is now in full condition for acceptance.

Respectfully,

 1/7/05

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